



US008925001B2

(12) **United States Patent**
Morris et al.

(10) **Patent No.:** **US 8,925,001 B2**
(45) **Date of Patent:** **Dec. 30, 2014**

(54) **MEDIA STREAM GENERATION BASED ON A CATEGORY OF USER EXPRESSION**

21/84 (2013.01); *H04N 21/8456* (2013.01);
H04N 21/4223 (2013.01); *H04N 21/44213*
(2013.01); *H04N 21/26603* (2013.01); *H04N*
21/44204 (2013.01)

(75) Inventors: **Scott Morris**, Decatur, GA (US); **Dale Malk**, Dunwoody, GA (US)

USPC **725/32**; 725/38; 725/91

(73) Assignee: **AT&T Intellectual Property I, L.P.**, Atlanta, GA (US)

(58) **Field of Classification Search**
USPC 725/46, 53
See application file for complete search history.

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1182 days.

(56) **References Cited**

U.S. PATENT DOCUMENTS

(21) Appl. No.: **12/209,381**

(22) Filed: **Sep. 12, 2008**

(65) **Prior Publication Data**

US 2010/0070992 A1 Mar. 18, 2010

6,585,521	B1 *	7/2003	Obrador	434/236
2002/0053078	A1 *	5/2002	Holtz et al.	725/14
2003/0188321	A1 *	10/2003	Shoff et al.	725/135
2005/0071865	A1	3/2005	Martins	
2006/0218573	A1 *	9/2006	Proebstel	725/14
2008/0031590	A1 *	2/2008	Kulas	386/92
2008/0091512	A1	4/2008	Marci et al.	
2008/0189733	A1 *	8/2008	Apostolopoulos	725/28
2009/0019467	A1 *	1/2009	Kim	725/14

* cited by examiner

Primary Examiner — Mark D Featherstone

(74) *Attorney, Agent, or Firm* — Toler Law Group, PC

(51) **Int. Cl.**

- H04N 7/10* (2006.01)
- H04N 7/025* (2006.01)
- G06F 3/00* (2006.01)
- G06F 13/00* (2006.01)
- H04N 5/445* (2011.01)
- H04N 7/173* (2011.01)
- H04N 21/658* (2011.01)
- H04N 21/25* (2011.01)
- H04N 21/84* (2011.01)
- H04N 21/845* (2011.01)
- H04N 21/4223* (2011.01)
- H04N 21/442* (2011.01)
- H04N 21/266* (2011.01)

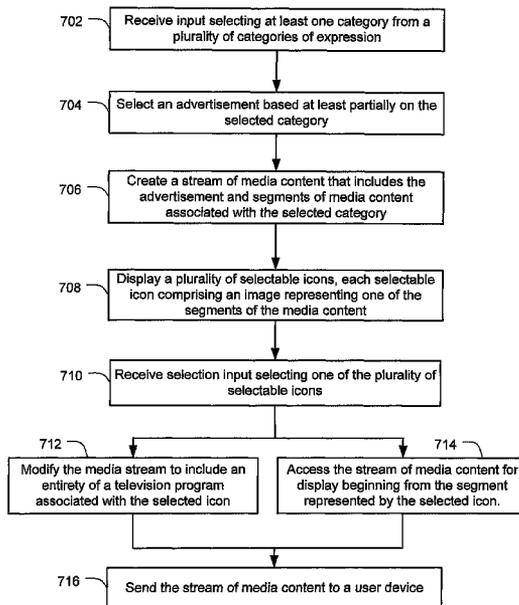
(57) **ABSTRACT**

Systems and methods of media stream generation based on categories of user expression are disclosed. In an embodiment, a method includes receiving input selecting at least one category from a plurality of categories of expression. Each of the plurality of categories is descriptive of a type of expression made by users as media content is presented. The method includes selecting a group of segments of the media content. Each of the segments of media content in the group is associated with the selected category. The method further includes generating a stream of media content that includes each of the segments of media content.

(52) **U.S. Cl.**

CPC *H04N 7/17336* (2013.01); *H04N 21/6582* (2013.01); *H04N 21/252* (2013.01); *H04N*

22 Claims, 10 Drawing Sheets



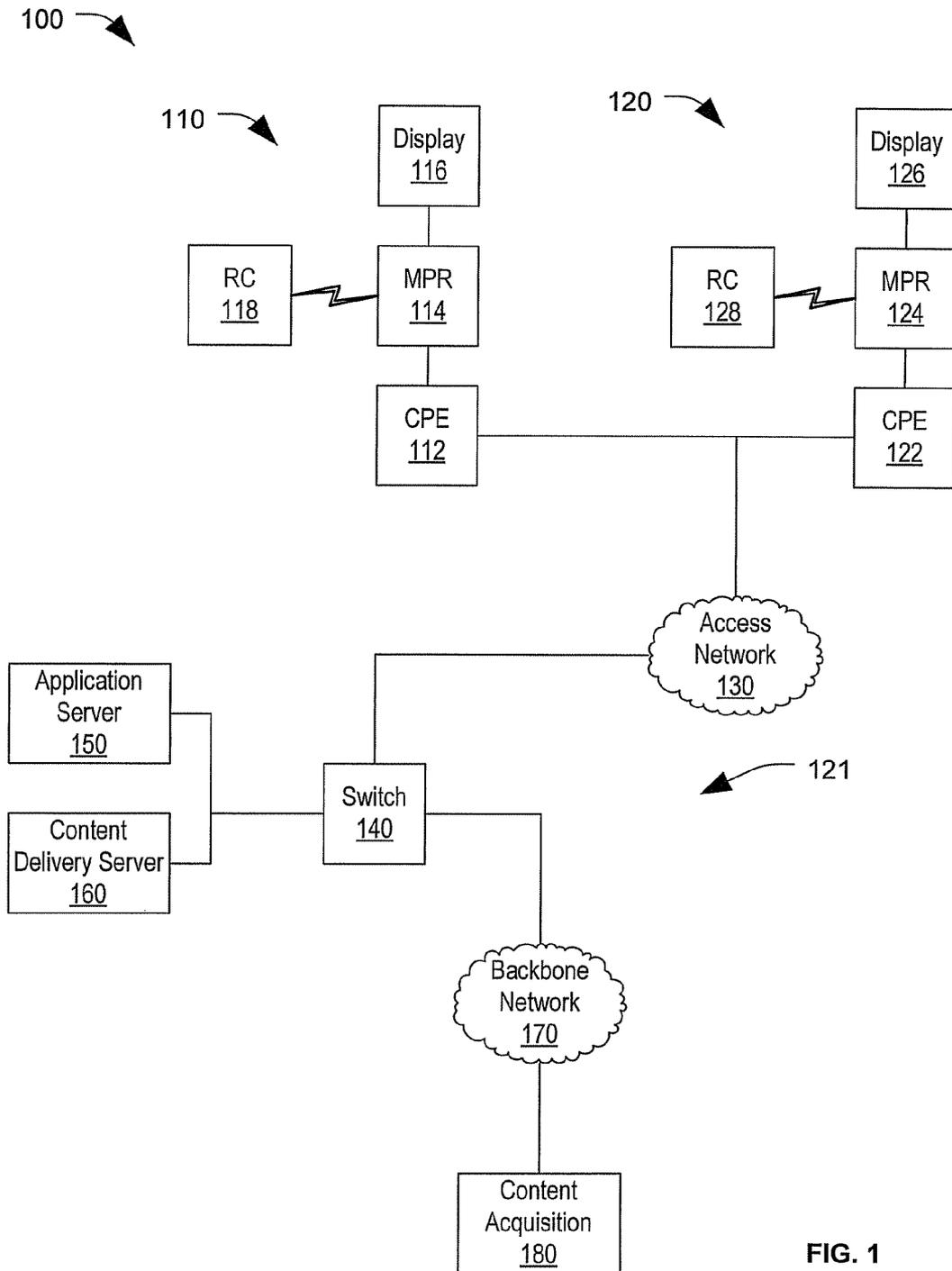


FIG. 1

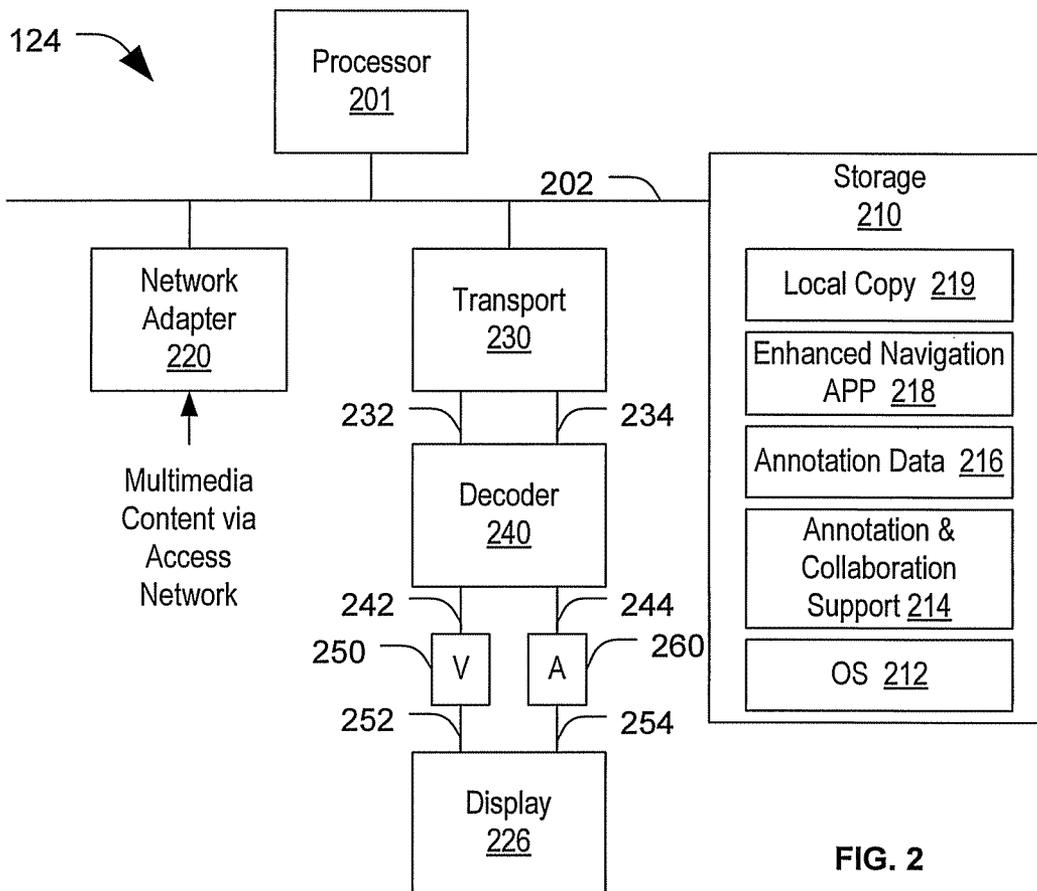


FIG. 2

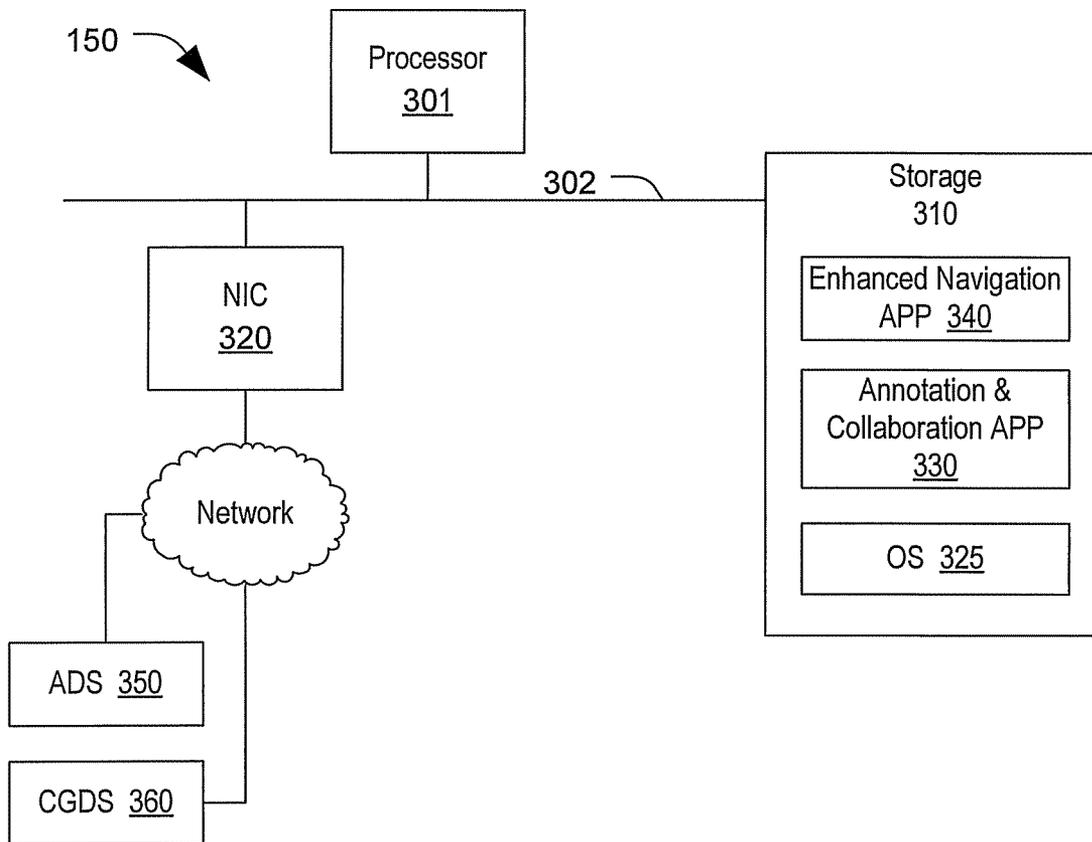


FIG. 3

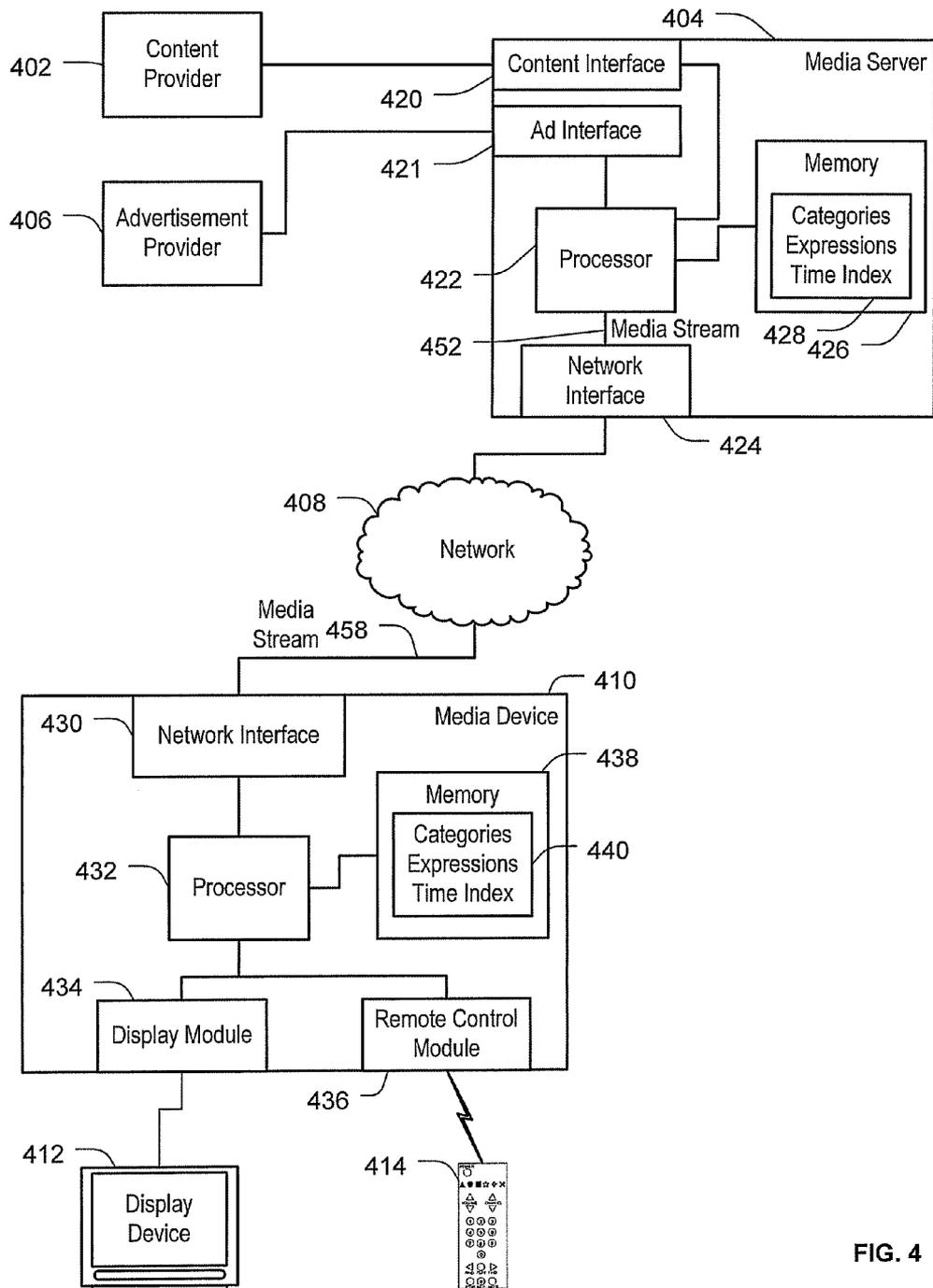


FIG. 4

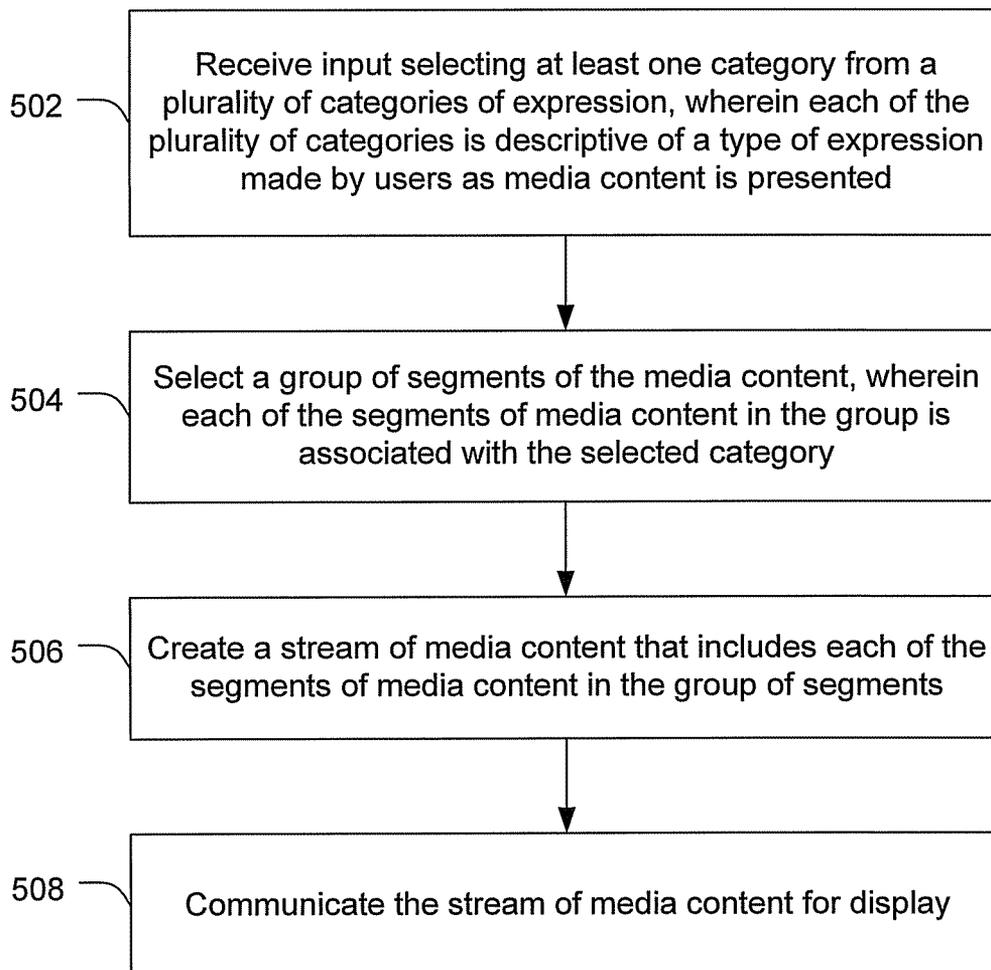


FIG. 5

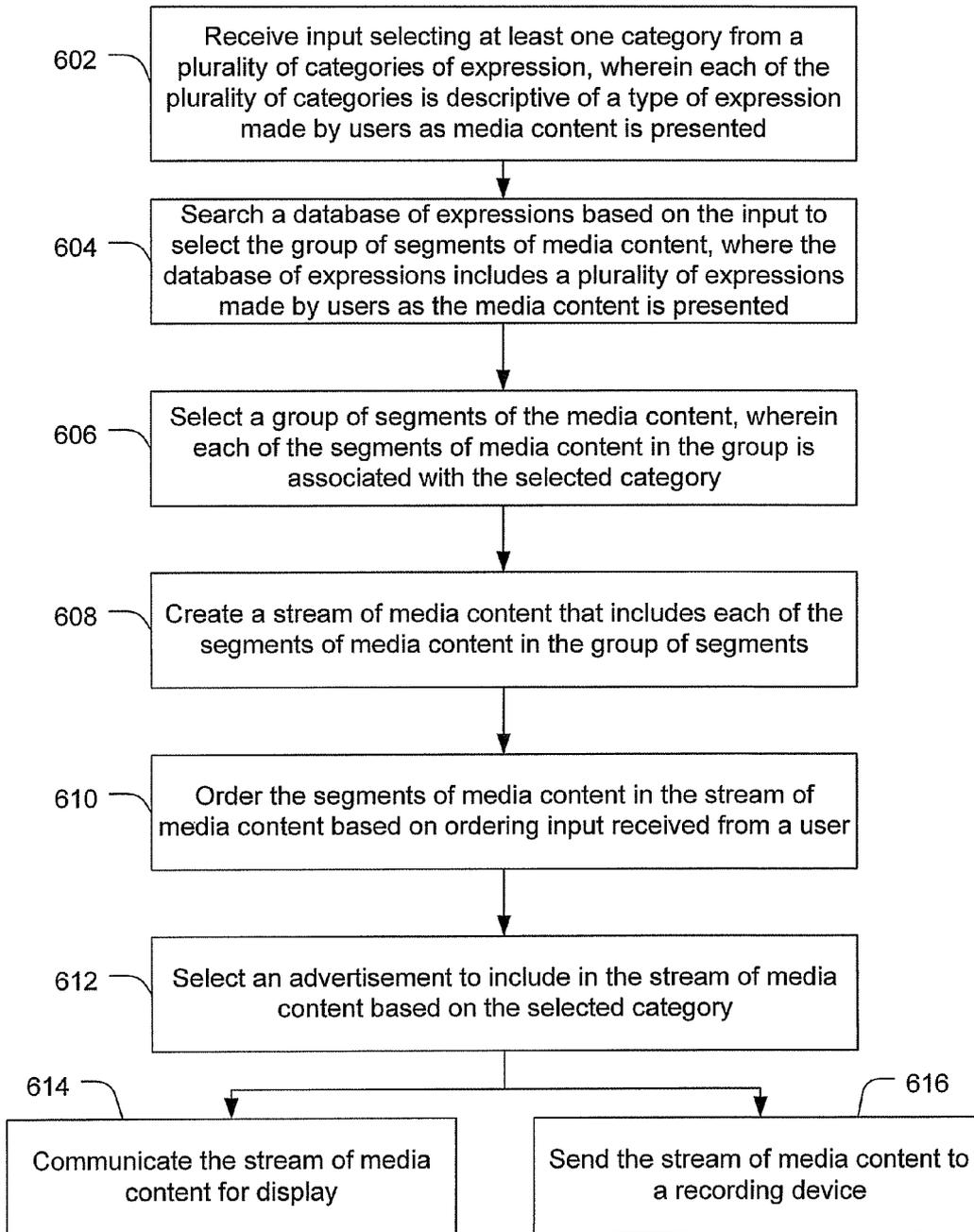


FIG. 6

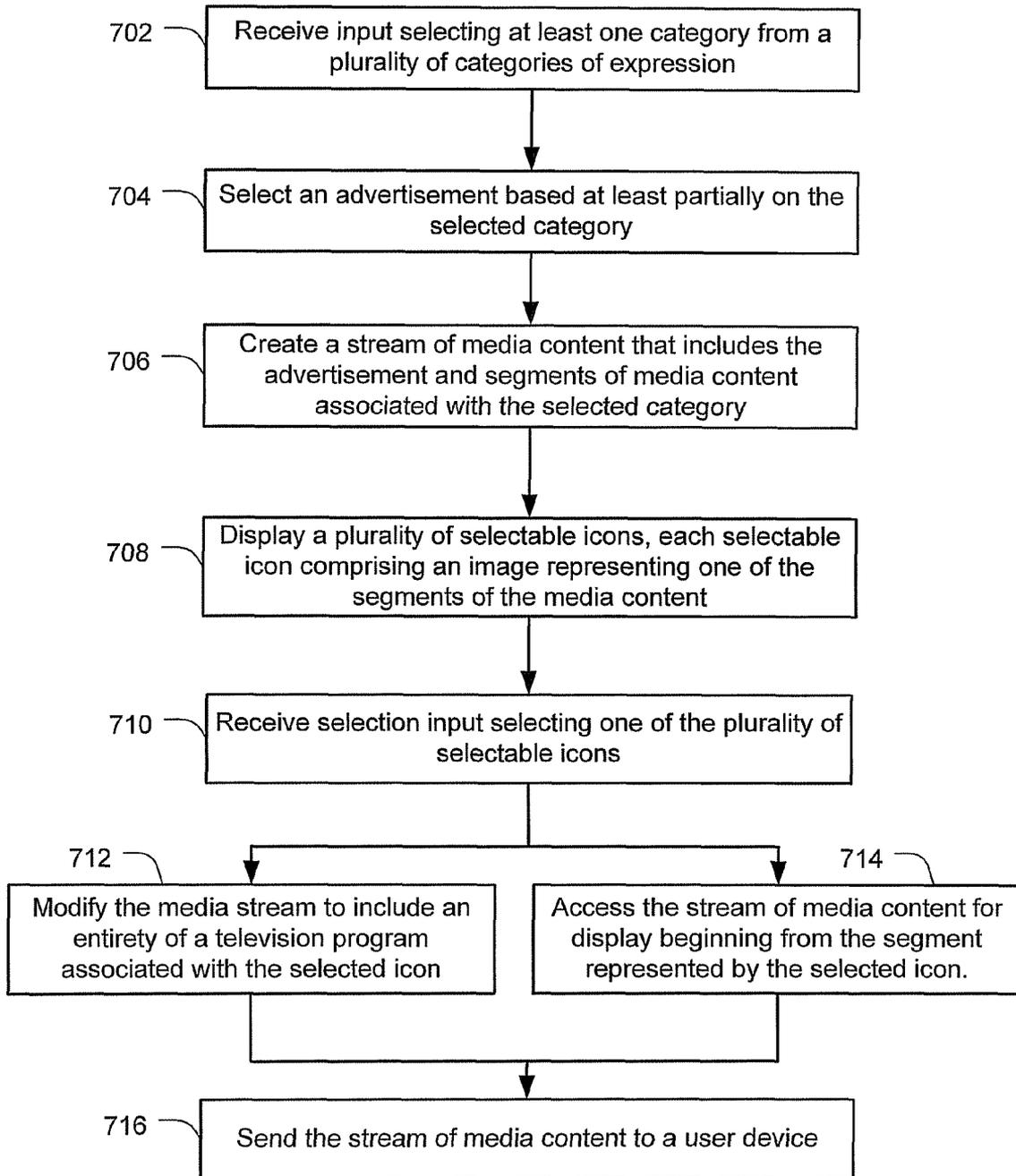


FIG. 7

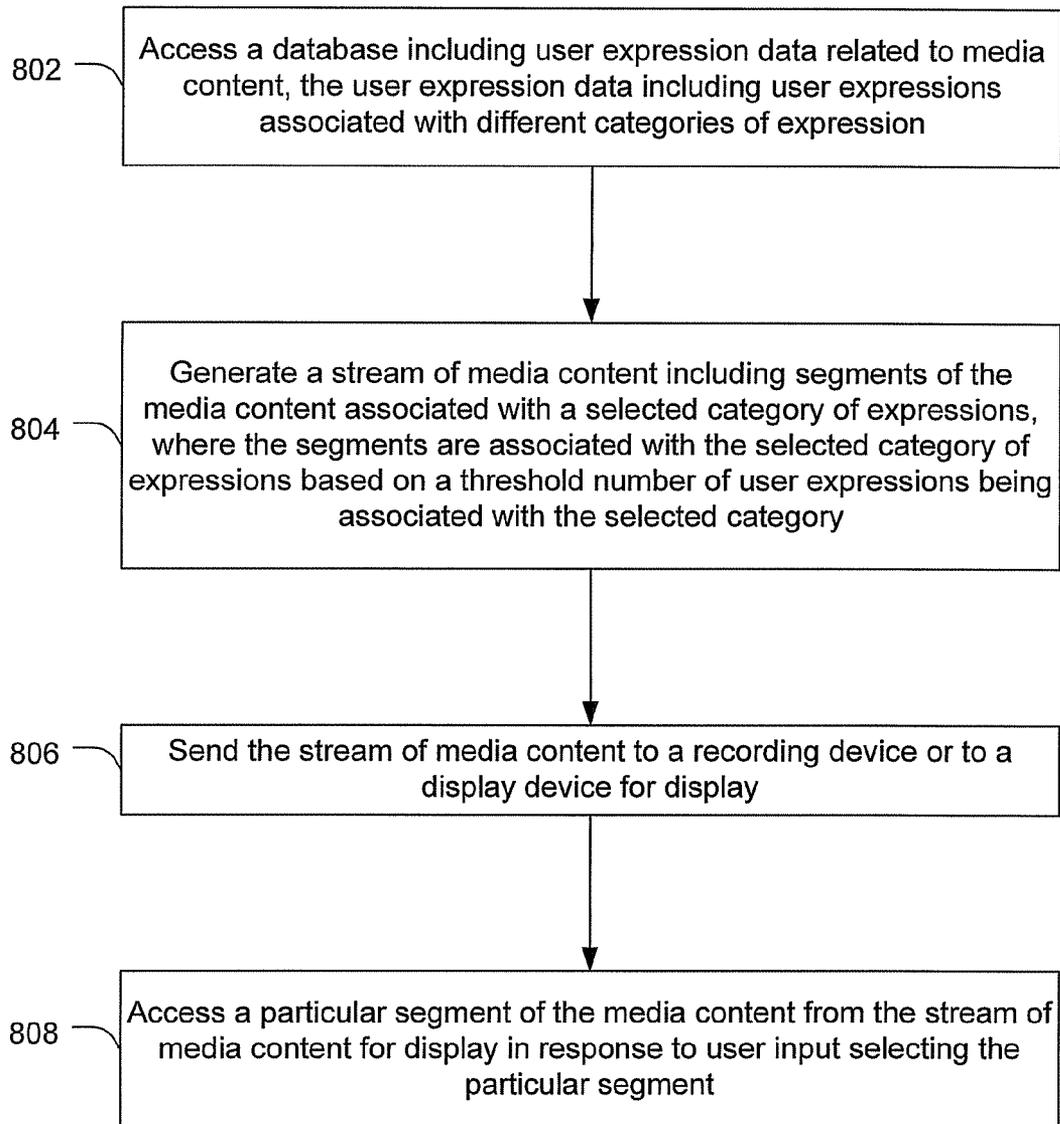


FIG. 8

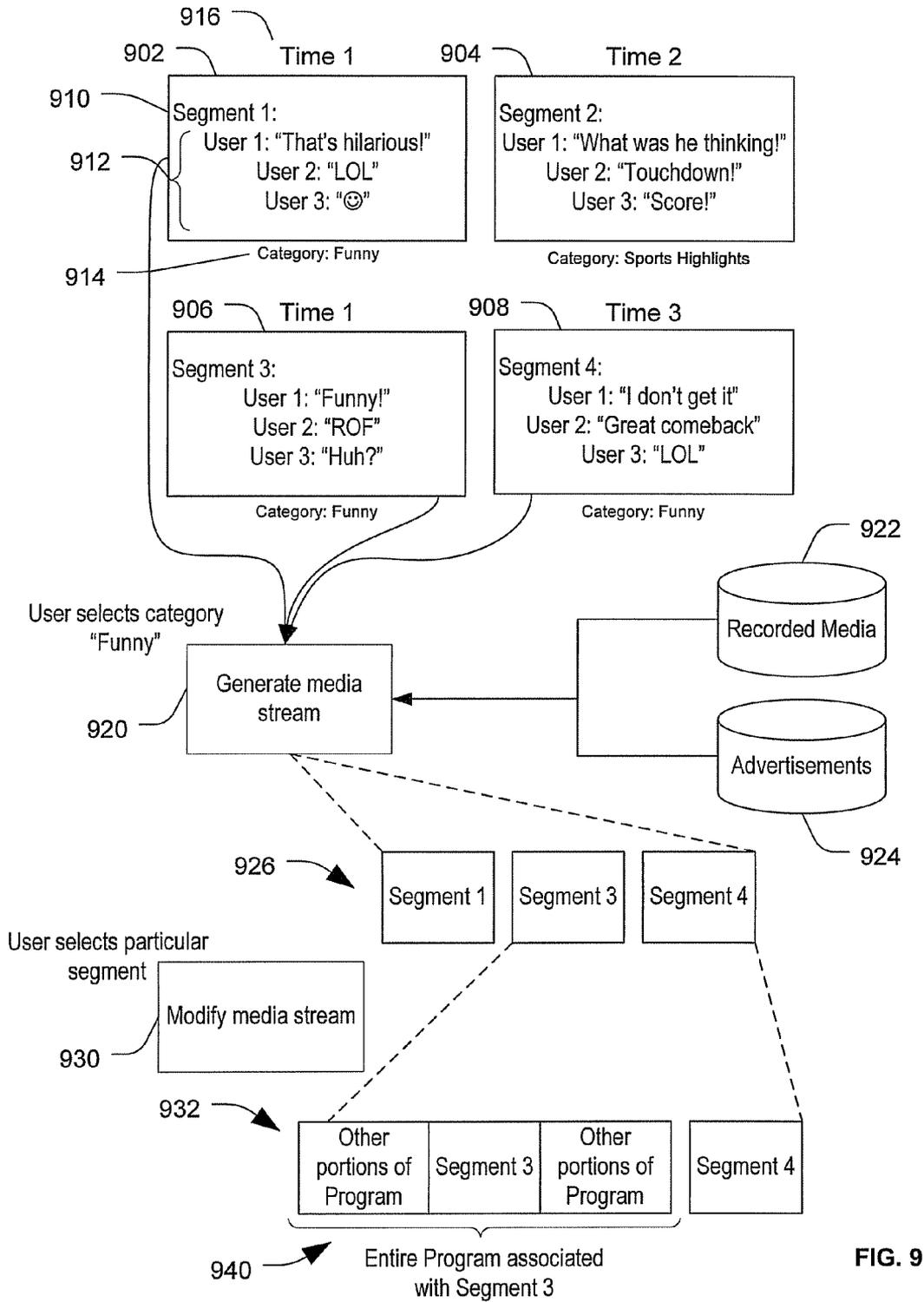


FIG. 9

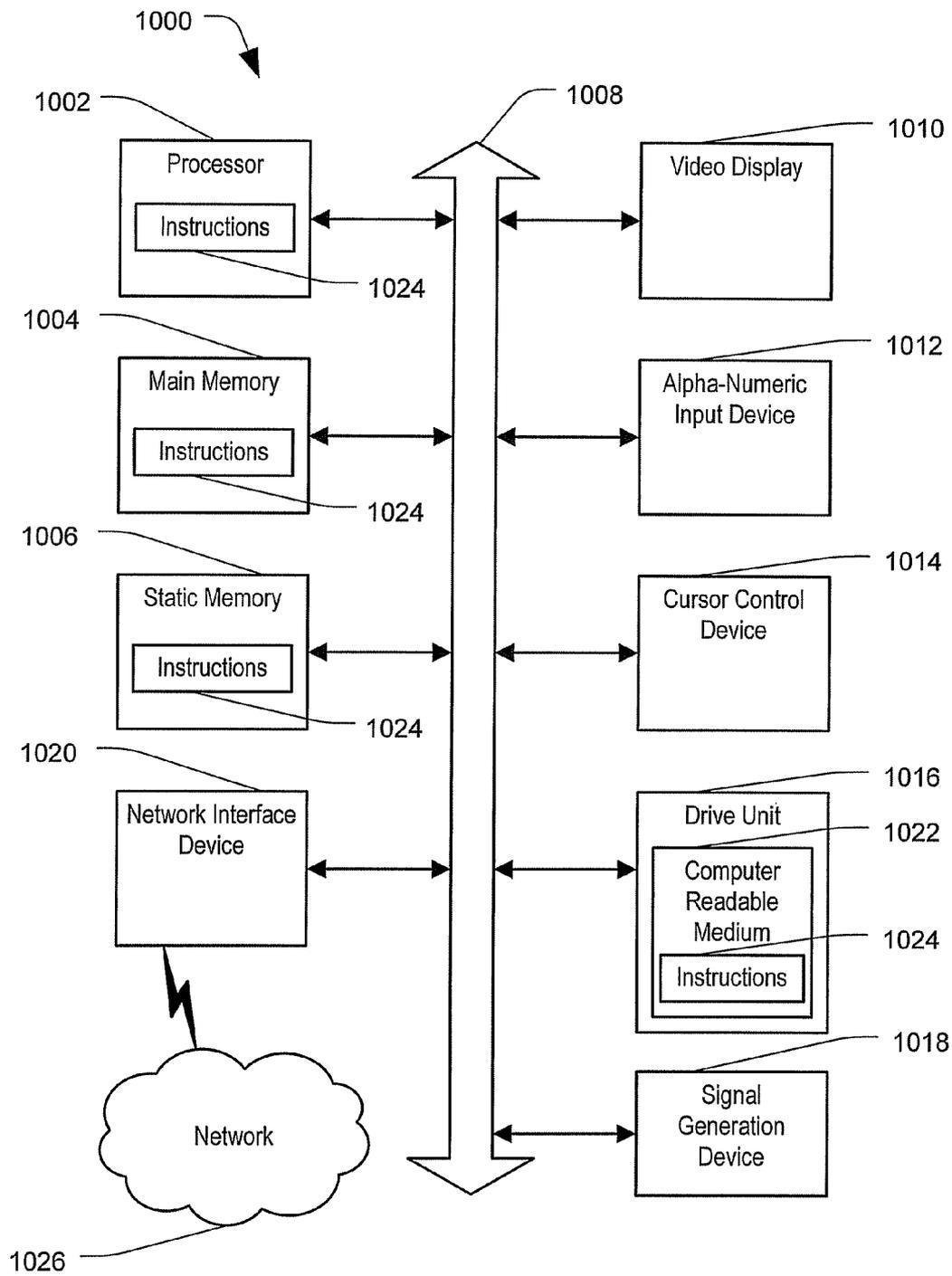


FIG. 10

MEDIA STREAM GENERATION BASED ON A CATEGORY OF USER EXPRESSION

FIELD OF THE DISCLOSURE

The present disclosure relates generally to media stream generation based on a category of user expression.

BACKGROUND

Television has historically been primarily a one-way communication medium. Television content has traditionally been determined by content providers based on aggregated user viewing statistics, such as Nielsen ratings, and TV has been delivered to broadcast viewers via satellite, cable or airway broadcasts. More recently, content providers have also provided content via interactive television signals using packet-switched networks that may enable viewers to respond to, or interact with, the content. However, even interactive television systems are used to distribute media content selected by content providers.

Communications service providers are expanding into new markets and new types of services and the ability to deliver a high-quality television offering has become increasingly important. Many service providers are transitioning from their prior role of access providers to entertainment experience providers. In addition, many service providers now deliver an increased range of video, voice, and data services to devices, both inside and outside the home. However, television viewers that desire to view particular types or categories of television content may become dissatisfied with distributed content that is limited by content providers.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of selected elements of a multimedia content distribution network;

FIG. 2 is a block diagram of selected elements of an embodiment of a multimedia processing resource suitable for supporting a collaborative annotation application;

FIG. 3 is a block diagram of selected elements of an embodiment of a server suitable for hosting a collaborative content annotation application;

FIG. 4 depicts a block diagram of a particular embodiment of a system to facilitate interactions between users with respect to a media stream;

FIG. 5 depicts a flow chart of a first particular embodiment of a method of generating a media stream based on user expression categories;

FIG. 6 depicts a flow chart of a second particular embodiment of a method of generating a media stream;

FIG. 7 depicts a flow chart of a third particular embodiment of a method of generating a media stream;

FIG. 8 depicts a flow chart of a fourth particular embodiment of a method of generating a media stream;

FIG. 9 depicts a data flow diagram of a particular embodiment of a method of generating a media stream and facilitating user interacting with the media stream; and

FIG. 10 depicts an illustrative embodiment of a general computer system.

DETAILED DESCRIPTION OF THE DRAWINGS

Systems and method of media stream generation based on categories of user expression are disclosed. In a particular embodiment, a method is disclosed that includes receiving input selecting at least one category from a plurality of cat-

egories of expression. Each of the categories is descriptive of a type of expression made by users as media content is presented. For example, the categories may include horror, humor, sporting events, or other categories. The method also includes selecting a group of segments of media content. Each of the segments of media content is associated with the selected category. The method further includes creating a stream of media content that includes each of the segments of media content in the group. The stream of media content may therefore provide content that is associated with the selected category.

In another embodiment, an apparatus is disclosed that includes a processor and a memory accessible to the processor. The memory includes a plurality of user expressions made in response to presentation of segments of media content. Each expression is time indexed to a corresponding portion of the media content. The memory includes a plurality of categories of types of expression, where each expression is associated with one or more of the categories. The apparatus also includes an interface to receive input selecting one or more of the categories. The processor creates a stream of media content that includes segments of the media content that are associated with the selected category in response to the input.

In another embodiment, a computer-readable medium is disclosed that includes instructions that, when executed by a processor, cause the processor to access a database including user expression data related to media content. The user expression data includes user expressions associated with different categories of expression. The instructions also cause the processor to generate a stream of media content including segments of the media content that are associated with a selected category of expression. In a particular embodiment, the segments are associated with the selected category of expression when a threshold number of user expressions are associated with the selected category.

In another embodiment, the computer-readable medium includes instructions that, when executed by a processor, cause the processor to receive input selecting at least one category from a plurality of categories of expression. Each of the categories is descriptive of a type of expression of a user in response to presentation of a segment of media content. The instructions also cause the processor to select an advertisement based at least partially on the selected category and to create a stream of media content that includes the advertisement and segments of media content associated with the selected category.

FIG. 1 is a block diagram illustrating selected elements of a first embodiment of a multimedia content delivery network **100**. The depicted embodiment of the multimedia content delivery network **100** includes functionality to facilitate collaborative annotating of a multimedia content stream and enhanced navigation of annotated streams based on the annotations. Although multimedia content is not limited to television, video-on-demand, or pay-per-view programs, the depicted embodiments of multimedia content delivery network **100** and its capabilities are described herein with reference to these types of multimedia content, which are interchangeably referred to herein as multimedia content program(s), multimedia programs, or simply, programs.

The elements of the multimedia content delivery network **100** illustrated in FIG. 1 emphasize the network's functionality for delivering multimedia content to one or more subscribers. As depicted in FIG. 1, the multimedia content delivery network **100** includes one or more clients **110** and **120**, where each client may represent a different subscriber, and a service provider **121** that encompasses resources to acquire,

process, and deliver programs to clients, such as representative clients **110** and **120**. Clients **110**, **120** and service provider **121** are demarcated by an access network **130** to which the clients **110**, **120** and the service provider **121** are connected. In some embodiments, the access network **130** is an Internet Protocol (IP) network, while in other embodiments, the access network **130** may be implemented as a conventional coaxial-based network. In IP network implementations of the access network **130**, the access network **130** may employ a physical layer of unshielded twisted pair cables, fiber optic cables, or both. As an example, the multimedia content delivery network **100** may employ digital subscriber line (DSL) compliant twisted pair connections between the clients **110**, **120** and a node (not depicted) in the access network **130**, while fiber cable or other broadband cable connects service provider resources to one or more nodes in the access network **130**. In other embodiments, the broadband cable may extend all the way to the clients **110** and **120**.

The client **110** depicted in FIG. 1 includes a network appliance identified as customer premises equipment (CPE) **112** that connects to the access network **130** and to a multimedia processing resource (MPR) **114**. The CPE **112** may supply routing, firewall, or other services for the clients **110**. CPE **112** may include elements of a broadband modem such as an asynchronous DSL (ADSL) modem as well as elements of a local area network (LAN) access point that supports a LAN to which the MPR **114** connects, such as an Ethernet compliant LAN, also referred to as an IEEE 811 LAN. The client **110**, as depicted in FIG. 1, further includes a display device or a display **116**. A remote control **118** of the client **110** is operable to communicate wirelessly to the MPR **114** using infrared or radio frequency signals. MPR **114** may receive input via buttons (not depicted) located on side panels of MPR **114**. The client **120** depicted in FIG. 1 includes a network appliance identified as CPE **122** that connects to the access network **130** and to a MPR **124**. The CPE **122** may supply routing, firewall, or other services for the clients **120**. CPE **122** may include elements of a broadband modem such as an ADSL modem as well as elements of a LAN access point that supports a LAN to which the MPR **124** connects, such as an Ethernet compliant LAN. The client **120**, as depicted in FIG. 1, further includes a display device or a display **126**. A remote control **128** of the client **120** is operable to communicate wirelessly to the MPR **124** using infrared or radio frequency signals. MPRs **124** may receive input via buttons (not depicted) located on side panels of MPRs **124**.

Each MPR **114**, **124** may be implemented as a stand-alone set top box suitable for use in a co-axial or IP-based multimedia content delivery network. In other embodiments, the MPR **124** may be integrated with the display **126**, with the CPE **122**, or both. Referring to FIG. 2, a block diagram illustrating selected elements of the MPR **124** is presented. In the depicted embodiment, the MPR **124** includes a processor **201** coupled to a storage media collectively identified as storage **210**, via a shared bus **202**. The storage **210** encompasses persistent and volatile media, fixed and removable media, and magnetic and semiconductor media. The storage **210** is operable to store instructions, data, or both. The storage **210**, as shown, includes multiple sets or sequences of instructions, namely, an operating system **212**, an application program identified as annotation and collaboration support **214**, and an application program identified as an enhanced navigation application **218**.

The operating system **212** may be a Unix® or Unix-like operating system, a Windows® family operating system, or another suitable operating system. The annotation and collaboration support **214** may operate in conjunction with an

annotation application, which may be hosted on an application server or a content delivery server of the service provider **121**, to facilitate collaborative annotation of a program of multimedia content. The enhanced navigation application **218** may include instructions to implement annotation based navigation of annotated programs and may further include instructions to support criteria based identification of desired locations within an annotated program.

The implementation of the MPR **124** depicted in FIG. 2 includes a data structure identified as annotation data **216** and a data structure identified as a local copy **219**, which represents a copy of the program of multimedia content. The annotation data **216** includes data that represents or is otherwise indicative of annotations created using the collaborative annotation application **330** and the annotation and collaboration support **214**, as described herein. In this embodiment, the annotation data **216** is maintained as a data structure that is separate and distinct from the program to which the annotation data corresponds. In this implementation, the annotation data **216** may be freely exchanged among users within a defined group independent of the underlying program. Each user may download or otherwise acquire a resident copy of a program, an example of which is illustrated in FIG. 2 as the local copy **219**. Thereafter, the annotation may be transferred or accessed as needed to reflect additions or other modifications to the annotation data **216**.

The MPR **124** as depicted in FIG. 2 further includes a network adapter **220** that interfaces the MPR **124** to the LAN, through which the MPR **124** receives multimedia content. In embodiments suitable for use in IP based content delivery networks, the MPR **124**, as depicted in FIG. 2, may include a transport unit **230** that assembles the payloads from a sequence or set of network packets into a stream of multimedia content. In coaxial based access networks, content may be delivered as a stream that is not packet-based and it may not be necessary in these embodiments to include the transport unit **230**. In a co-axial implementation, the clients **120** may require tuning resources (not explicitly depicted in FIG. 1) to “parse” desired content from other content that is delivered over the coaxial medium simultaneously and these tuners may be provided in the MPRs **124**. The stream of multimedia content received by the transport unit **230** may include audio information and video information, and the transport unit **230** may parse or segregate the information to generate a video stream **232** and an audio stream **234** as shown.

The video and audio streams **232** and **234**, as output from the transport unit **230**, may include audio or video information that is compressed, encrypted, or both. A decoder unit **240** is shown as receiving the video and audio streams **232** and **234** and generating native format video and audio streams **242** and **244**. The decoder **240** may employ any of various widely distributed video decoding algorithms including any of the Motion Pictures Expert Group (MPEG) standards and the Windows Media Video (WMV) standards including WMV 9, which has been standardized as Video Codec-1 (VC-1) by the Society of Motion Picture and Television Engineers. Similarly, the decoder **240** may employ any of various audio decoding algorithms including Dolby® Digital, Digital Theatre System (DTS) Coherent Acoustics and Windows Media Audio (WMA).

The native format video and audio streams **242** and **244** as shown in FIG. 2, may be processed by encoders/digital-to-analog converters (encoders/DACs) **250** and **260** respectively, to produce analog video and audio signals **252** and **254** in a format compliant with the display **226**, which itself may not be a part of the MPR **124**. The display **226** may comply

5

with a National Television Systems Committee (NTSC), Phase Alternating Line (PAL) or any other suitable television standard.

Returning to FIG. 1, the selected elements representing the service provider 121 include content acquisition resources 180 connected to a switch 140 via a backbone network 170. An application server 150 and a content delivery server 160 are also shown connected to the switch 140. The switch 140 may provide firewall and routing functions to demarcate the access network 130 from the resources of the service provider 121. The switch 140 may be housed in a central office or other facility of the service provider 121. In embodiments that employ DSL compliant connections, the switch 140 may include elements of a DSL Access Multiplexer (DSLAM) that multiplexes many subscriber DSL lines to the backbone network 170. The backbone network 170 represents a private network including, as an example, a fiber based network to accommodate high data transfer rates. Content acquisition resources 180 as depicted in FIG. 1 encompass the acquisition of various types of content including broadcast content, other "live" content including national content feeds, and video-on-demand content.

Acquired content is provided to a content delivery server 160 via the backbone network 170 and the switch 140. Content may be delivered from the content delivery server 160 to the clients 120 via the switch 140 and the access network 130. Content may be compressed, encrypted, modulated, demodulated, and otherwise encoded or processed at the content acquisition resources 180, the content delivery server 160, or both. Although FIG. 1 depicts a single element encompassing acquisition of all content, different types of content may be acquired via different types of acquisition resources. Similarly, although FIG. 1 depicts a single content delivery server 160, different types of content may be delivered by different servers. Moreover, embodiments of the multimedia content delivery network 100 may include content acquisition resources in regional offices that are connected to the switch 140.

Although the service provider 121 is depicted in FIG. 1 as having a single switch 140 to which the content acquisition resources 180, the content delivery server 160, and the application server 150 are connected, other embodiments may employ different switches for each of these functional components and may include additional functional components not depicted in FIG. 1 including, for example, operational subsystem support (OSS) resources.

FIG. 1 illustrates the application server 150 connected to the switch 140. The application server 150 may host or otherwise implement one or more applications for the multimedia content delivery network 100. Applications provided by the application server 150 may be downloaded and hosted on other network resources including, for example, the content delivery server 160, the switch 140, the CPE 122, and/or the MPR 124.

Referring to FIG. 3, a block diagram depicts selected elements of an embodiment of the application server 150 including support for collaborative annotation as described herein. In the depicted embodiment, the application server 150 includes at least one processor 301 that is operable to access storage 310 via a shared bus 302. A network interface card (NIC) 320 connects to the shared bus 302 and supports communication between the processor 301 and network connected resources.

Some embodiments of the multimedia content distribution multimedia content delivery network 100 as described herein include functionality that supports collaborative annotation

6

of multimedia content programs and enhanced, annotation-based navigation of annotated programs.

In the depicted embodiment, the storage 310 of the application server 150 includes instructions that define an operating system 325, a collaborative annotation application 330, and an enhanced navigation application 340. As depicted in FIG. 3, the application server 150 has networked access to remote data structures including an annotation data structure 350 and a collaboration group data structure 360 that may be used in conjunction with the collaborative annotation application 330. In other embodiments, the data represented by the data structures 350 and/or 360 may be included within the storage 310.

FIG. 4 depicts a particular embodiment of a system to facilitate interactions between users with respect to a media stream. The system includes a media server 404 coupled to a content provider 402 and adapted to provide a media stream 458 via a network 408 to a representative media device 410. In a particular embodiment, the media server 404 includes elements of one or more of the application server 150 and the content delivery server 160, of FIG. 1, and the media device 410 is the MPR 124 of FIGS. 1-2. The media device 410 may be coupled to a display device 412 to provide a display at the display device 412 that includes display of the media stream 458. In a particular embodiment, the media device 410 is a set-top box device, such as an Internet Protocol television (IPTV) set-top box device, a video gaming device or console, a personal computer or other computing device that is adapted to emulate set-top box device functionalities, any other device adapted to receive content and transmit data to a media system via a network, or any combination thereof. For example, the media device 410 may include a memory 438 adapted to record portions of the media stream 458. In a particular embodiment, the system is an Internet Protocol Television (IPTV) system adapted to provide television programming via the network 408 to multiple user devices, such as the media device 410. The IPTV system may be configured to provide content to the media device 410 from the media server 404 via one or more unicast or multicast packet streams to be decoded and buffered at the media device 410 for display at the display device 412. The media server 404 may include one or more network elements of the IPTV system, and the network interface 424 may include a data transmission interface to send a stream of media content via the IPTV system.

The media server 404 includes a processor 422 and a memory 426 accessible to the processor 422. The memory 426 includes data 428 that includes a plurality of user expressions made in response to presentations of segments of media content. For example, the data 428 may include a database including user expression data related to media content. In a particular embodiment, each expression is time indexed to a corresponding portion of the media content. The data 428 also includes a plurality of categories of types of expressions where each expression is associated with one or more categories. The media server 404 also includes a content interface 420 adapted to receive content from the content provider 402. The content may include television programming, video-on-demand programming, pay-per-view programming, or other video, audio or multimedia programming.

The media server 404 includes an advertisement interface 421 adapted to receive advertising content from an advertisement provider 406. The advertising content may be targeted to one or more users based on information available to the media server 404 regarding the particular users targeted. For example, the advertisement content may be selected based on media content watched by or accessed by the user, based on

user preference settings of the user, or based on historical interactions with users, such as purchases made by the user via the network 408. The media server 404 also includes a network interface 424 adapted to send the media stream 452 via the network 408 to one or more media devices, such as the representative media device 410.

The media device 410 includes a network interface 430 to receive the media stream 458 from the network 408 and includes a processor 432 to process the media stream 458 for display via a display device 412. The media device 410 includes the memory 438 accessible to the processor 432. In a particular embodiment, the network interface 430, the processor 432, and the memory 438 correspond to the network adapter 220, the processor 201, and the storage 210 of the MPR 124 depicted in FIG. 2. The media device 410 also includes a remote control module 436 adapted to receive control input from a remote control device 414. In a particular embodiment, the memory 438 stores a plurality of user expressions made in response to presentations of segments of media content 440. The expressions may be time indexed to corresponding portions of the media content. Additionally, the memory 438 may include a plurality of categories of types of expressions where each expression is associated with one or more of the categories. For example, user expressions may include textual data such as comments typed or entered by users, facial expressions or body gestures such as may be captured by still or video cameras, audible expressions such as may be captured by a microphone, or other expressions that may provide information regarding a particular viewed segment of the media content 440. Examples of categories may include comedy, horror, and sporting events/highlights.

In operation, the media server 404 may facilitate interactions by users of media devices coupled to the network 408. For example, a user of the representative media device 410 may interact with other users (not shown) by providing input via the remote control device 414 or another input device to comment on or interacting with the media stream 458. Interactive input provided by the user may be stored at the media server 408, at the media device 410, or at a database of expressions that stores interactive input received from all of the users that provide input with respect to the media stream 458.

For example, the media stream 458 may include a particular program of television content and interaction among the users may include comments on the program. Expressions provide by the users may be captured such as by text entry of the users, by microphones or cameras configured to capture users speech, facial expressions, or body language of the users, or via other methods such as interaction with a graphical user interface. The expressions received from the users during the interactions may be saved in the database of expressions and categorized based on the categories that are descriptive of the types of expressions made. For example, expressions indicating that particular content is "funny" may be stored in the category identified as "funny". In another example, expressions related to a sporting event indicating that a score is made may be stored in a "sports highlight" category. The expressions may be time indexed to a particular portion of the media stream that was viewed when the expression is received. Accordingly, the database of expressions may be used to access particular segments of video content or of media content to create a media stream including content related to particular categories of expressions. For example, a user may select one or more particular categories from a plurality of categories of expressions, and the media server 404 may select a group of segments of media content where each segment of the media content in the group is associated

with the one or more selected categories. The media server 404 may then generate a stream of media content 452 that includes each of the segments of media content in the group. The media server may communicate the stream of media content to the media device 410 for display at the display device 412. In another particular embodiment, the media server 404 may communicate the media stream 458 to the media device 410 for recording.

Thus, the media server 404 is adapted to generate a media stream that includes particular content of interest to a user. For example, the media stream may include a "best of highlights" reel from various sporting events that occurred during a specified time period. In another example, the media stream 452 may include a "best of highlights" reel from various comedy programs presented during a specified time period, such as a week or day. For example, the category of user expressions may be selected when a particular threshold number of users express ideas related to the category. For example, where a threshold number of users indicate that a particular portion of media content is "funny", the portion of media content may be associated with a category "funny". Thus, by selecting a category, the user may be able to receive a generated stream of media content that includes only portions of programs that were identified by other viewers (e.g. a minimum threshold number of users) as being associated with that category. For example, the threshold number of viewers may be set at a predetermined amount, such as five hundred viewers that make expressions related to a selected category as the particular portion of the program was presented, or may be set as a percentage of viewers, such as thirty percent of viewers, or may be determined according to particular category type, content type, or based on other factors.

Additionally, the media server 404 may be adapted to provide targeted advertising from the advertisement provider 406 related to the media stream 452. For example, a targeted advertisement may be selected based on the particular category selected by the user to generate the media stream 452. The targeted advertisement content may be inserted into the media stream 452 to provide the targeted advertising to the user along with the media stream. Providing one or more targeted advertisements in the media stream may provide advertisers the opportunity to reach an audience that may have particular interest or affinity in the advertiser's products or services, may and also benefits viewers with information of available goods or services of particular interest to the viewers. Such targeted advertisements may be more effective than untargeted or broadcast advertisements, and thus placement of the targeted advertisements may be used to generate additional revenue for the system provider.

FIG. 5 depicts a flow chart of a first particular embodiment of a method of creating a media stream. The method includes receiving input selecting at least one category from a plurality of categories of expression at 502. Each of the plurality of categories of expression is descriptive of a type of expression made by a user as media content is presented. For example, user expressions indicating that a particular portion of media content is "scary" may be associated with a category of "horror".

The method also includes, at 504, selecting a group of segments of media content. Each of the segments of media content is in a group that is associated with the selected category. For example, expressions received from users may be analyzed to determine appropriate categories to which the expressions apply. The expressions may be time indexed to portions of media content. Thus, by selecting a particular

category of expression, a set or group of segments of media content may be identified and used to generate a personalized media stream.

The method also includes creating a stream of media content that includes each of the segments of media content in the group of segments at 506. The stream of media content may be communicated for display, at 508. According to a particular embodiment, a user can generate a stream of media content including segments of media content that are associated with particular categories of expression. Each of the segments of media content may include all or a portion of a particular television program or other media program.

FIG. 6 depicts a second particular embodiment of a method of generating a media stream. The method includes receiving input selecting at least one category from a plurality of categories of expression, at 602. Each of the categories is descriptive of a type of expression made by a user as media content is presented. The method includes searching a database of expressions based on the input to select a group of segments of media content, at 604. For example, the database of expressions may include expressions made by users that were time indexed to particular media content and categorized based on the type of expression. The method also includes selecting a group of segments of the media content, at 606. Each of the segments of the media content in the group is associated with the selected category. The method further includes creating a stream of media content that includes each of the segments of the media content in the group of segments, at 608. The method includes ordering the segments of the media content in the stream based on ordering input received from a user, at 610. The method also includes selecting an advertisement to include in the stream of media content based on the selected category at 612. In a particular embodiment, the method includes communicating the stream of media content for display, at 614. In another particular embodiment, the method includes sending the stream of media content to a recording device, such as a digital video recorder (DVR) or network based DVR at 616.

Thus, users may select and receive media content based on the users' preferences and to receive targeted advertisements appropriate for viewers of the content. The media content may be selected based on expressions provided by or recorded from other viewers and may be deemed a more accurate categorization by users than other methods of categorization. Users may therefore request and receive specifically categorized media content for enjoyment that is organized based on the requesting user's ordering criteria. For example, the user may elect to have the media stream ordered based on the number of expressions associated with the category, based on other criteria or metadata associated with the content, or any combination thereof. In addition, the media stream may not include entire programs, such as entire television programs, and may instead include, for example, a video clip that is a subset of one of a plurality of television programs. To illustrate, a "sports highlights" category may include video clips of exciting segments of multiple televised games based on user expressions without including the entire games.

FIG. 7 depicts a third particular embodiment of a method to generate a media stream. The method includes receiving user input selecting at least on category from a plurality of available categories of expression, at 702. Each of the plurality of categories is descriptive of a type of expression made by users as the content is presented. The method includes selecting an advertisement based at least partially on the selected category, at 704. The method further includes creating a stream

of media content that includes the advertisement and the segments of media content associated with the selected category at 706.

The method may also include displaying a plurality of selectable icons, at 708. Each of the selectable icons may include an image representing one of the segments of the media content. The method may also include receiving selection input, selecting one of the plurality of selectable icons, at 710. In response to selection of the one or more selectable icons, the method may include modifying the media stream to include an entirety of a television programs associated with the selected icon, at 712. For example, the segments of media content may include portions of television programs. Thus, the stream of media content may include segments or portions of individual programs, and no particular program may be represented in its entirety.

In another particular embodiment, one or more programs are represented in their entirety, but not all programs are represented in their entirety. By selecting one of the selectable icons, the media streams may be modified to include an entire program associated with the selected icon. The modified media stream may be sent to a user device for display, at 716. In another particular embodiment, in response to receiving selection input selecting one or more selectable icons, at 710, the method includes accessing the stream of media content for display beginning at the segment represented by the selected icon, at 714. For example, where the stream of media content includes a plurality of segments of media content, the user may desire to advance to or to start from a particular segment. By selecting a user selectable icon associated with a particular segment, the media stream may be advanced to the content associated with the selected icon. The method may further include sending the stream of media content to a user device for display or for recording, at 716.

FIG. 8 depicts a flow chart of a fourth particular embodiment of a method of generating a media steam. The method includes accessing a database including user expression data related to media content, at 802. The user expression data includes user expressions associated with different categories of expression. The method includes generating a stream of media content including the segments of the media content associated with a selected category of expression, at 804. The segments are associated with the selected category of expression based on a threshold number of user expressions being associated with the selected category. For example, a segment may be associated with a selected category when a predetermined number of user expressions corresponding to that segment are associated with the selected category. To illustrate, when a threshold number of viewer expressions for a segment of a movie indicate that the segment is frightening, the segment may be selected with a "horror" category. The method also includes sending the stream of media content to a recording device or to a display device for display, at 806. In a particular embodiment, the method further includes accessing a particular segment of the media content from the stream of media content for display and in response to the user input selecting the particular segment at 808. For example, each segment of the media content may be represented by a user selectable icon. By selecting one of the user selectable icons (e.g. using a remote control device), the user may select a particular segment of media content for display.

FIG. 9 depicts a data flow diagram of particular embodiment of a method of generating a media stream and interacting with the media stream. The method includes storing a plurality of data records related to segments of media content. The data records may be stored in an expression database. A first representative data record 902 is associated with a first

segment of media content **910** and includes a plurality of user expressions **912** associated with the first segment of media content **910**. The first data record **902** is further associated with a time stamp **916** that relates the time that the user expressions were received with a particular portion of media content, in particular, the time of display of the first segment **910**. The first data record **902** is further associated with a category **914**. In particular, based on the user expressions **912** indicating that the particular segment **910** is “funny”, the category associated with the data record is the category “funny”. Additionally, a second data record **904** identifies user expressions associated with a second segment of media content displayed at a second time. The user expressions associated with the second segment of media content and the second data record **904** indicate that the second segment is recorded as a “sports highlight”. Thus, the category associated with the second data record is “sports highlights”. A third data record **906** also includes user expressions indicating that the media content associated with the data record is “funny”, and the third data record is associated with the category “funny”. A fourth data record, **908**, is associated with a fourth segment of media content and with user expressions indicating that the media content is “funny”. Thus, the fourth data record **908** is associated with the “funny” category of user expression. The first data record **902** and the third data record **906** are associated with a time index indicating that user expressions related to the first segment of the media content and the third segment of the media content were received for display at about the same time. For example, the first segment of media content may be associated with a portion of a first television program and the third segment of media content may be associated with a portion of a second television program. The first and second television programs may have been broadcast or otherwise displayed to the users at approximately the same time.

In a particular embodiment, a user may select a category, such as the category “funny”, from a list of available categories. In response to a user selection of the category “funny”, the system may generate a media stream including segments of media content related to the category at **920**. In the particular embodiment illustrated, the first segment **902**, the third segment **906**, and the fourth segment **908** are selected to generate the personalized media content based on the expression category. The method may access the media content at a recorded media database **922**. Additionally, one or more advertisements may be selected based on the selected category and/or based on other information related to the user from an advertisement database **924**. For example, multiple targeted advertisements may be selected to include with the selected segments.

A media stream **926** may be generated based on the data records **902**, **906**, **908**, the recorded media **922**, and the advertisement database **924**. The media stream may be sent to a user device for display or recording. In a particular embodiment, while observing the content of the media stream, the user may select a particular segment and the media stream may be modified, at **930**. For example, the media stream may be modified to start at a different segment than the first segment. In another particular embodiment as illustrated in FIG. **9**, the media stream is modified by accessing additional portions of a particular program. For example, when a user selects the third segment, the media stream may be modified, as illustrated at **932**, to include the entire program associated with the third segment **940**. The media stream may continue after displaying the entire program associated with the third segment to show the remaining portions of the media stream, such as illustrated in segment four.

Referring to FIG. **10**, an illustrative embodiment of a general computer system is shown and is designated **1000**. The computer system **1000** can include a set of instructions that can be executed to cause the computer system **1000** to perform any one or more of the methods or computer based functions disclosed herein. The computer system **1000** may operate as a standalone device or may be connected, e.g., using a network, to other computer systems or peripheral devices. For example, the computer system **1000** may include or be included within any one or more of the processors, computers, communication networks, servers, media processing resources, or media device, as shown in FIGS. **1-4**.

In a networked deployment, the computer system may operate in the capacity of a server or as a client user computer in a server-client user network environment, or as a peer computer system in a peer-to-peer (or distributed) network environment. The computer system **1000**, or portions thereof, can also be implemented as or incorporated into various devices, such as a personal computer (PC), a tablet PC, a personal digital assistant (PDA), a mobile device, a palmtop computer, a laptop computer, a desktop computer, a communications device, a wireless telephone, a control system, a camera, a printer, a pager, a personal trusted device, a web appliance, a network router, switch or bridge, or any other machine capable of executing a set of instructions (sequential or otherwise) that specify actions to be taken by that machine. In a particular embodiment, the computer system **1000** can be implemented using electronic devices that provide voice, video, and data communication. Further, while a single computer system **1000** is illustrated, the term “system” shall also be taken to include any collection of systems or sub-systems that individually or jointly execute a set, or multiple sets, of instructions to perform one or more computer functions.

As illustrated in FIG. **10**, the computer system **1000** may include a processor **1002**, e.g., a central processing unit (CPU), a graphics processing unit (GPU), or both. Moreover, the computer system **1000** can include a main memory **1004** and a static memory **1006**, that can communicate with each other via a bus **1008**. As shown, the computer system **1000** may further include a video display unit **1010**, such as a liquid crystal display (LCD), a projection television display, a flat panel display, a plasma display, a solid state display, or a cathode ray tube (CRT). Additionally, the computer system **1000** may include an input device **1012**, such as a remote control device having a wireless keypad, a keyboard, a microphone coupled to a speech recognition engine, a camera such as a video camera or still camera, or a cursor control device **1014**, such as a mouse device. The computer system **1000** can also include a disk drive unit **1016**, a signal generation device **1018**, such as a speaker or a remote control, and a network interface device **1020**.

In a particular embodiment, as depicted in FIG. **10**, the disk drive unit **1016** may include a computer-readable medium **1022** in which one or more sets of instructions **1024**, e.g. software, can be embedded. Further, the instructions **1024** may embody one or more of the methods or logic as described herein. In a particular embodiment, the instructions **1024** may reside completely, or at least partially, within the main memory **1004**, the static memory **1006**, and/or within the processor **1002** during execution by the computer system **1000**. The main memory **1004** and the processor **1002** also may include computer-readable media.

In an alternative embodiment, dedicated hardware implementations, such as application specific integrated circuits, programmable logic arrays and other hardware devices, can be constructed to implement one or more of the methods described herein. Applications that may include the apparatus

and systems of various embodiments can broadly include a variety of electronic and computer systems. One or more embodiments described herein may implement functions using two or more specific interconnected hardware modules or devices with related control and data signals that can be communicated between and through the modules, or as portions of an application-specific integrated circuit. Accordingly, the present system encompasses software, firmware, and hardware implementations, or combinations thereof.

In accordance with various embodiments of the present disclosure, the methods described herein may be implemented by software programs executable by a computer system. Further, in an exemplary, non-limited embodiment, implementations can include distributed processing, component/object distributed processing, and parallel processing. Alternatively, virtual computer system processing can be constructed to implement one or more of the methods or functionality as described herein.

The present disclosure contemplates a computer-readable medium that includes instructions **1024** or receives and executes instructions **1024** responsive to a propagated signal, so that a device connected to a network **1026** can communicate voice, video or data over the network **1026**. Further, the instructions **1024** may be transmitted or received over the network **1026** via the network interface device **1020**.

While the computer-readable medium is shown to be a single medium, the term “computer-readable medium” includes a single medium or multiple media, such as a centralized or distributed database, and/or associated caches and servers that store one or more sets of instructions. The term “computer-readable medium” shall also include any medium that is capable of storing, encoding or carrying a set of instructions for execution by a processor or that cause a computer system to perform any one or more of the methods or operations disclosed herein.

In a particular non-limiting, exemplary embodiment, the computer-readable medium can include a solid-state memory such as a memory card or other package that houses one or more non-volatile read-only memories. Further, the computer-readable medium can be a random access memory or other volatile re-writable memory. Additionally, the computer-readable medium can include a magneto-optical or optical medium, such as a disk or tapes or other storage device to capture carrier wave signals such as a signal communicated over a transmission medium. A digital file attachment to an e-mail or other self-contained information archive or set of archives may be considered equivalent to a tangible storage medium. Accordingly, the disclosure is considered to include any one or more of a computer-readable medium or other equivalents and successor media, in which data or instructions may be stored.

Although the present specification describes components and functions that may be implemented in particular embodiments with reference to particular standards and protocols, the disclosed embodiments are not limited to such standards and protocols. For example, standards for Internet and other packet switched network transmission (e.g., TCP/IP, UDP/IP, HTML, HTTP) as well as television standards (e.g., SDTV, NTSC, PAL, SECAM, HDTV, ATSC, DVB-T, ISDB-T), represent examples of the state of the art. Such standards are periodically superseded by faster or more efficient standards having essentially the same functions. Accordingly, replacement standards and protocols having the same or similar functions as those disclosed herein are considered equivalents thereof.

The illustrations of the embodiments described herein are intended to provide a general understanding of the structure

of the various embodiments. The illustrations are not intended to serve as a complete description of all of the elements and features of apparatus and systems that utilize the structures or methods described herein. Many other embodiments may be apparent to those of skill in the art upon reviewing the disclosure. Other embodiments may be utilized and derived from the disclosure, such that structural and logical substitutions and changes may be made without departing from the scope of the disclosure. Accordingly, the disclosure and the figures are to be regarded as illustrative rather than restrictive.

One or more embodiments of the disclosure may be referred to herein, individually and/or collectively, by the term “invention” merely for convenience and without intending to voluntarily limit the scope of this application to any particular invention or inventive concept. Moreover, although specific embodiments have been illustrated and described herein, it should be appreciated that any subsequent arrangement designed to achieve the same or similar purpose may be substituted for the specific embodiments shown. This disclosure is intended to cover any and all subsequent adaptations or variations of various embodiments. Combinations of the above embodiments, and other embodiments not specifically described herein, will be apparent to those of skill in the art upon reviewing the description.

The Abstract of the Disclosure is provided to comply with 37 C.F.R. §1.72(b) and is submitted with the understanding that it will not be used to interpret or limit the scope or meaning of the claims. In addition, in the foregoing Detailed Description, various features may be grouped together or described in a single embodiment for the purpose of streamlining the disclosure. This disclosure is not to be interpreted as reflecting an intention that the claimed embodiments require more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive subject matter may be directed to less than all of the features of any of the disclosed embodiments. Thus, the following claims are incorporated into the Detailed Description, with each claim standing on its own as defining separately claimed subject matter.

The above-disclosed subject matter is to be considered illustrative, and not restrictive, and the appended claims are intended to cover all modifications, enhancements, and other embodiments, that fall within the true spirit and scope of the present disclosure. Thus, to the maximum extent allowed by law, the scope of the present invention is to be determined by the broadest permissible interpretation of the following claims and their equivalents, and shall not be restricted or limited by the foregoing detailed description.

What is claimed is:

1. A method, comprising:

at a media server, receiving a first input selecting a category from a plurality of categories, wherein each of the plurality of categories is descriptive of a type of expression made by users as media content is presented;

selecting a group of segments of the media content, wherein each of the segments of the group of segments is associated with the selected category, wherein the group of segments includes a first segment that is associated with a portion of a first program, wherein the group of segments includes a second segment that is associated with a portion of a second program, and wherein the first program is different than the second program;

creating a media stream that includes each of the segments of the group, wherein the first segment precedes the second segment in the media stream;

receiving a second input selecting the first segment prior to sending the media stream to a user device;

15

modifying the media stream by replacing the first segment with an entirety of the first program; and after modifying the media stream, sending the modified stream to the user device, wherein the modified stream includes the second segment following the entirety of the first program.

2. The method of claim 1, further comprising modifying the media stream to start at a different segment than a beginning segment.

3. The method of claim 1, wherein the media stream includes an advertisement.

4. The method of claim 1, further comprising sending the media stream to a recording device.

5. The method of claim 1, further comprising searching a database of expressions based on user input to select the group of segments of the media content, wherein the database of expressions includes a plurality of expressions made by users when the media content was presented.

6. The method of claim 1, wherein the type of expression includes words entered by the users.

7. The method of claim 3, wherein the advertisement is selected based on the selected.

8. The method of claim 5, wherein each expression in the database of expressions is time indexed to a particular segment of media content when the expression was made by users.

9. The method of claim 5, wherein the plurality of expressions includes at least one textual expression that is stored as a searchable text entry.

10. The method of claim 8, wherein selecting the category includes selecting the category when at least a threshold number of expressions related to the category have been made by users as the particular segment of media content was presented.

11. A computer-readable storage device comprising instructions that, when executed by a processor, cause the processor to perform operations comprising:

generating a stream of media content including a group of segments of the media content associated with a selected category of expressions, wherein the segments of the media content include a first segment of the media content that is associated with a portion of a first program and include a second segment of the media content that is associated with a portion of a second program, wherein the first program is different than the second program, and wherein the first segment precedes the second segment in the stream of media content;

receiving a selection of the first segment prior to sending the stream of media content to a user device;

modifying the stream of media content, in response to receiving the selection of the first segment, by replacing the first segment with an entirety of the first program; and

after modifying the stream of media content, sending the modified stream to the user device, wherein the modified media stream includes the second segment following the entirety of the first program.

12. The computer-readable storage device of claim 11, wherein the operations further comprise beginning the stream of media content with access a particular segment of the stream of media content in response to user input selecting the particular segment.

13. The computer-readable storage device of claim 11, wherein the operations further comprise sending the stream of media content to a recording device.

14. The computer-readable storage device of claim 11, wherein the processor searches a database of expressions

16

based on received input to select the group of segments of the media content, wherein the database of expressions includes a plurality of expressions made by users when the media content was presented, and wherein the plurality of expressions includes at least one textual expression that is stored as a searchable text entry.

15. A system comprising a processor and a memory, wherein the memory stores instructions that, when executed by the processor, cause the processor to perform operations comprising:

receiving a first input selecting a category from a plurality of categories, wherein each of the plurality of categories is descriptive of a type of expression made by users as media content is presented;

generating a stream of media content that includes a plurality of segments of media content associated with the selected category, wherein the plurality of segments includes a first segment that is associated with a portion of a first program, wherein the plurality of segments includes a second segment that is associated with a portion of a second program, wherein the first program is different than the second program, and wherein the first segment precedes the second segment in the media stream;

receiving a second input selecting the first segment prior to sending the media stream to a user device;

modifying the stream, in response to receiving the second input, by replacing the first segment with an entirety of the first program; and

after modifying the media stream, sending the modified media stream to the user device, wherein the modified media stream includes the second segment following the entirety of the first program.

16. The system of claim 15, wherein the operations further comprise sending the stream of media content to the user device via an internet protocol television system.

17. The system of claim 15, wherein the operations further comprise initiating display of a plurality of selectable icons, each selectable icon comprising an image representing one of the segments of the media content.

18. The system of claim 15, wherein the processor searches a database of expressions based on received input to select the plurality of segments of the media content, wherein the database of expressions includes a plurality of expressions made by users when the media content was presented, wherein the plurality of expressions includes at least one textual expression that is stored as a searchable text entry.

19. The system of claim 17, wherein the operations further comprise:

receiving a selection input selecting one of the plurality of selectable icons, and

sending the stream of media content for display beginning at the segment represented by the selected one of the plurality of selectable icons.

20. An apparatus comprising:

a processor; and

a memory including instructions that, when executed by the processor, cause the processor to perform operations comprising:

receiving a first input selecting a category from a plurality of categories, wherein each category of the plurality of categories is descriptive of a type of expression made by users as media content is presented;

displaying a plurality of selectable icons, wherein each selectable icon of the plurality of selectable icons represents a segment of a group of segments of the media content, wherein each segment of the group of

segments is associated with the selected category, wherein the group of segments includes a first segment that is associated with a portion of a first program wherein the group of segments includes a second segment that is associated with a portion of a second program, wherein the first program is different than the second program, and wherein the first segment precedes the second segment in a media stream; receiving a second input selecting an icon of the plurality of selectable icons, the icon representing the first segment, wherein the second input is received prior to receiving the media stream; and
in response to the selection of the first segment, receiving a modified media stream, wherein the first segment is replaced with an entirety of the first program, and wherein the modified stream includes the second segment following the entirety of the first program.

21. The apparatus of claim **20**, wherein the processor and the memory are integrated into a set-top box device, and wherein the apparatus further comprises a remote control interface, wherein each of the first input and the second input is received via the remote control interface from a remote control device.

22. The apparatus of claim **20**, wherein the apparatus receives the media stream via an Internet Protocol Television system.

* * * * *